SUBJECT: Learning how to Innovate? ENGI 614 Fall 2016

COURSE DESCRIPTION

Innovation has become a buzzword. Many of us aspire to be successful innovators, but how? Can you actually learn how to innovate? There is ample attention in Universities for entrepreneurship, but how to support your innovation ambition. This course aims to give you an unconventional innovation experience. In this course, you will:

- ❑ Learn basic theory and tools to help you with invention, innovation and entrepreneurship.
- ❑ Have the opportunity to interact with several top innovators in the space, medical and energy industries, and learn about their invention and innovation approaches.
- ❑ Apply what you learn to your own innovation experience. For a challenge you select, rapidly move from invention to innovation, and experience how you can move your ideas towards reality.

Course structure: A typical 2h course will be a combination of (classes may differ):

- ❑ A short lecture on invention, innovation and entrepreneurship theory and tools
- ❑ Practice in teams to apply several tools
- ❑ Active interaction with top inventors and innovators, using prepared Interview questions
- ❑ Active team work on your own or fellow students invention/innovation challenge

Learning objectives:

- ❑ Realization that invention, innovation and entrepreneurship skills can be acquired and are essential to be more effective and efficient in solving key challenges and generating change.
- ❑ Practical experience with the application of several invention and innovation tools.
- ❑ Insight in a wide portfolio of invention and innovation tools
- ❑ Obtaining valuable and inspirational insights from top inventors and innovators
- ❑ Hands on experience in applying several tools on an invention/innovation challenge.

Target students:

Graduates/PhD candidates with passion to change our World.
Non-engineers from any Department at Rice are also very welcome and encouraged to enroll.

INSTRUCTOR: **Dr. Henk Mooiweer**
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CLASSROOM AND SCHEDULE: **room: BRC 284** **Mondays, 1.00 - 3.29 pm**

Classrooms are not subject to change unless otherwise noted

THIS SYLLABUS IS SUBJECT TO CHANGE THROUGHOUT THE SEMESTER

				FIRST HOUR				SECOND HOUR	
	Mon		**Theme**	**Lecture topic [30 MIN]**	**source**	**Practice [30 min]**	**key learnings**	**Second hour: hands on**	**key learnings**
Aug 22	1		**Introduction**	overview invention, innovation and entrepreneurship		discussions and exchange of experience and learning goals	Difference between invention, innovation and entrepreneurship and overview of	GUEST INVENTOR	extract peragmatic lessones learned from renowned inventor
Aug 29	2		**invention**	How to produce creative and useful ideas	Prof Roberta Ness - Innovation Generation	practice 2 techniques	some practice with several creativity and invention	WORK WITH GROUPS ON OWN INVENTION CHALLENGES	
Sep 5	**Labor day**		**NO CLASS**						
Sep 12	3		**invention**	TRIZ - theory of inventive problem solving	several TRIZ books	example TRIZ	some insight in systematic invention using TRIZ methodology	GUEST INVENTOR	extract peragmatic lessones learned from renowned
Sep 19	4		**invention**	Gamestorming - portfolio of games to	Gamestorming - a playbook for innovators	practice 2 techniques	toolbox of pratical tools to support invention	WORK WITH GROUPS ON OWN INVENTION	
Sep 26	5		**invention**	Speedmatching - facilitated process to connect the dots	Henk Mooiweer - Innovenate LLC	practice speedmatching	invention by facilitated interaction of experts	practice speedmatching	extract peragmatic lessones learned from renowned
Oct 3	6		**invention**	The art of invention - the creastive process	The Art of invention - Steven Paley	practice 2 techniques	series of approaches to invent	GUEST INVENTOR	
Oct 10	**recess**		**NO CLASS**						
Oct 17	7		**invention**	overview of a range of invention / innovation approaches	The Innovation Expedition - Gijs van Wulfen	practice 2 techniques	overview of a range of invention / innovation approaches	GUEST INNOVATOR	extract peragmatic lessones learned from renowned
Oct 24	8		**innovation**	Evolutionary vs Revolutionary innovation	Henk Mooiweer - Innovenate LLC	class discussion	insight in different innovation types and approaches	WORK WITH GROUPS ON OWN	insight in different innovation types and approaches
Oct 31	9		**innovation**	Value Proposition Canvas	Strategyzer	pratice for 2 CVPs	practical way to define customer value proposition	GUEST INNOVATOR	extract peragmatic lessones learned from renowned
Nov 7	10		**innovation**	Proof of Concept Speed framing	Henk Mooiweer - Innovenate LLC	practice for 1 innovation	pratical approach to rapidly define a fast and affordable way to Proof of Concept	WORK WITH GROUPS ON OWN INNOVATION CHALLENGES	pratical approach to rapidly define a fast and affordable way to Proof of Concept
Nov 14	11		**innovation**	10 types of innovation	Larry keeley	practice for 2 archetypes	overview of innovation arhetypes	GUEST INNOVATOR	extract peragmatic lessones learned from renowned
Nov 21	12		**entrepreneurship**	Business Model Canvas	Strategyzer	practice for 2 business model canvasses	systematic approach to build a visual business	WORK WITH GROUPS ON OWN	systematic approach to build a visual business
Nov 28	13	last class	**entrepreneurship**	Disciplined entrepreneurship - 24 steps	Prof Bill Aulet - MIT	class discussion	systemetic approach in 24 steps to design and build a	GUEST ENTERPRENEUR	extract peragmatic lessones learned from renowned
Dec 5	**study days**		**NO CLASS**						

Policies and additional information relevant to this course:

1. Attendance Requirement: Students are expected to attend all classes offered in fall 2016. The course involves significant practice with materials and project work. Absences might impact your team performance and effectiveness of the course. Attendance will be taken. Missing more than two classes without valid reason may impact your grade.

2. Known Absence Policy: The instructor will only grant excused absences if the reason is justifiable and the student takes the initiative to seek prior approval according to the policies outlined below. **Every effort should be made to schedule/re-schedule potentially conflicting events so that they do not conflict with this course.**

3. Absence Notification procedures: Students with exceptional circumstances will be approved for absence on a case-by-case basis by the course instructor, under the conditions that the instructor is notified by email at least 2 weeks prior to the date of absence, unless in case of emergency.

4. Timeliness. Late arrivals might impact your team performance and effectiveness of the course. Students are expected to arrive in class on time. Class will start promptly at 1.05 pm.

5. Rice Honor Code

Students are responsible for maintaining the highest standards of honesty and integrity in their work and conduct. Students should be familiar with what constitutes plagiarism and always cite proper references of outside materials. Students should abide by the honor pledge they made upon entering Rice and include the following statement on all submitted assignments: "On my honor, I have neither given nor received any unauthorized aid on this (paper or exam)".

6. Special Needs

Let us know during the first few weeks of the semester if you have disability needs and we will do what we can to accommodate these needs. Students with disabilities should contact Rice Disability Support services at 713 348 5841 or http://dss.rice.edu

7. Grading

- 40% active participation in class and preparation and execution interviews inventors and innovators
- 60% : assignment on personal invention and innovation toolkit and assignment on case study

8. Text:

The course will use several sources to provide invention, innovation and entrepreneurship tools.
The following six books are recommended course materials:

- **Ten types of Innovation** – the discipline of building breakthroughs, Larry Keeley, John Wiley & Sons, 2013
- **Gamestorming – A playbook for innovators, Rule breakers and Change makers**, Dave Gray et al, O'Reilly, 2010

- **The Innovation Expedition: A Visual Toolkit to Start Innovation**, Gijs van Wulfen, BIS publishers, 2013
- **Business Model Generation – a handbook for Visionaries, Game Changers, and Challengers**, Alexander Osterwalder and Yves Pigneur, John Wiley & Sons, 2010
- **Creativity in the Sciences – a workbook to Innovation Generation,** Michael Goodman et al, Oxford University Press, 2013
- **Disciplined entrepreneurship**, Bill Aulet, John Wiley & Sons, 2013